

We claim:

1. A method for preparing a nitric oxide-releasing metallic surface comprising:

- a) stably binding a nucleophile residue to a metallic surface; and
- b) reacting said surface having a nucleophile residue with nitric oxide gas.

2. The method for preparing a nitric oxide-releasing metallic surface of claim 1 wherein said metallic surface is stainless steel.

3. The method for preparing a nitric oxide-releasing metallic surface of claim 1 wherein said nucleophile residue is an aminofunctional silane selected from the group consisting of 4,7,10-triazadecyl-trimethoxysilane, 3-aminopropyltriethoxysilane, 3-aminopropyltrimethoxysilane, 3-aminopropyldiisopropylethoxysilane, and 3-aminopropylmethyldiethoxysilane

4. The method for preparing a nitric oxide-releasing metallic surface of claim 1 wherein said surface having a nucleophile residue is reacted with said nitric oxide gas under an anaerobic pressurized environment.

5. A method for preparing a nitric oxide-releasing metallic surface comprising:

- a) silanizing a metallic surface;
- b) bonding a nucleophile containing compound to said silanized metallic surface; and
- c) reacting said nucleophile containing compound bonded to said silanized metallic surface with nitric oxide gas.

6. The method for preparing a nitric oxide-releasing metallic surface of claim 5 wherein said silanizing step further comprises reacting said metallic surfaces with a silanizing compound selected from the group consisting of a vinylsilane and an isocyanatosilane.

7. The method for preparing a nitric oxide-releasing metallic surface of claim 6 wherein said vinylsilane is trichlorovinyl silane.

8. The method for preparing a nitric oxide-releasing metallic surfaces of claim 6 wherein said isocyanatosilane is 3-isocyanatopropyl-triethoxysilane.

9. The method for preparing a nitric oxide-releasing metallic surface of claim 5 wherein said nucleophile containing compound is selected from the group consisting of C<sub>1</sub>-C<sub>10</sub> cycloalkyl, alkyl and alkenyl monoamines, methylamine, ethylamine, diethylamine, ethylmethylamine, triethylamine, n-propylamine, allylamine, isopropylamine, n-butylamine, n-butylmethylamine, n-amylamine, n-hexylamine, 2-ethylhexylamine, cyclohexylamine, ethylenediamine, polyethyleneamine, 1,4-butanediamine, 1,6-hexanediamine, n-methylcyclohexylamine, alkeneamines, ethyleneimine and polyethylenimine.

10. The method for preparing a nitric oxide-releasing metallic surface of claim 5 further comprising:

cross-linking said nucleophile residue containing compound prior to reacting said nucleophile with said nitric oxide gas;

reacting said cross-linked nucleophile containing compound with at least one nucleophile compound to enrich said metallic surface with additional nucleophile residues; and

reacting said metallic surface with additional nucleophile residues with nitric oxide gas.

11. The method for preparing a nitric oxide-releasing metallic surface of claim 5 wherein said surface having a nucleophile residue containing silane is reacted with said nitric oxide gas under an anaerobic pressurized environment.

12. A method for preparing a nitric oxide-releasing metallic surface comprising:

- c) applying said mixture to said metallic surface.

13. Medical devices for delivering nitric oxide in therapeutic concentrations for sustained periods of time comprising: metallic surfaces having nitric oxide releasably bound thereto through diazeniumdiolated nucleophiles coupled to silane intermediates, said silane intermediates being bound to said metallic surface.

14. The medical devices for delivering nitric oxide in therapeutic concentrations for sustained periods of time of claim 13 wherein said medical device is selected from the group consisting of arterial stents, guide wires, catheters, trocar needles, bone anchors, bone screws, protective platings, hip and joint implants, electrical leads, biosensors and probes.

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